Nittany Mineralogical Society Bulletin

Nittany Mineralogical Society, Inc.
P.O. Box 10664
State College PA 16805

February, 2012 **Visit our web site: www.nittanymineral.org** *Editor (see page 8): David C. Glick*

February 15th meeting:

Coal and Coal Mining

by
Dr. Charles E. Miller, Jr.
Retired Geologist

Our February meeting will be held Wednesday the 15th in the room 116 auditorium of Earth & Engineering Sciences Building on the west side of the Penn State campus in State College, PA. Maps are available through our web site.*

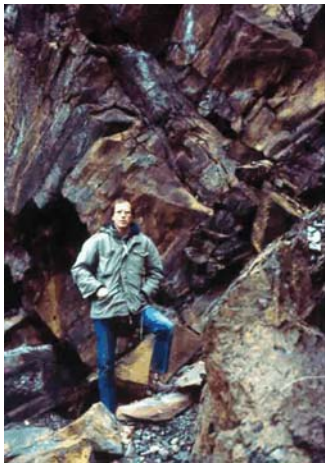
6:30 to 7:30 p.m.: Social hour, refreshments in the lobby
7:30 to 8:00 p.m.: Annual Meeting & Elections, announcements, questions, answers; door prize drawings
about 8:00 p.m.: featured program

The event has free admission, free parking, and free refreshments, and is open to all – ***Bring your friends and share an enjoyable evening.***

***small auditorium to the left of our usual room**.

Please see the full article on page 4.

Dr. Miller will present a wide-ranging talk with interesting stories from his extensive work with coal and coal mining. He reports that it will include:


The author below a petrified tree trunk.

Introduction
Our inherited legacy from old mining laws
Remining (how the State is fixing old problems)
Age of Pennsylvania's coal
How coal is formed
Peat and grades of coal
Surface coal-mining observations
Auger mining
Underclays
Blasting
Other fatalities
Other environmental effects of coal mining
Applied use of fossils in coal mining
Electroshocking
Deep (underground) mining
Mountain top removal
Paleostream analyses and a coal mine in Philipsburg
A hydrogeological investigation of a surface coal mine
The Knox Mine Disaster video

Junior Rockhounds
meet February 15th

Junior Rockhounds will continue to meet at 5:00 p.m. on the third Wednesday of the month, the same as last Fall. That's the same night as our regular meetings; this month it's February 15th. We will meet in room 121 Earth & Engineering Sciences Building.

Each month's Junior Rockhounds meeting has a new topic or topics with fun, hands-on learning for the kids. We encourage those who attend to become NMS members, but it's not required. Just $7.00 covers a whole year (through October 2012) of student membership. Parents may get a lot out of the meetings, too! Check the web site for news, or contact Dr. Andrew Sicree (see page 8). *- Editor*

Celestine for Pennsylvania State Mineral

from Royce Black

Editor's note: Although the facebook page is titled "state rock," they are indeed working toward having it designated the state **mineral**. The links are also on the NMS web site, http://www.nittanymineral.org .

I am a 6th grade student at Commonwealth Connections Academy. I did a science paper on what would I like to have as a state rock/mineral, and I was excited to find that there was none already listed. So, I am on a journey to get Celestine named as the Pennsylvania State Mineral. I am working with Representative Stephen Bloom to start a resolution, and he has explained the steps involved. I am currently in the 'lobbying' step. I am drumming up state wide support of my intent to have Celestine become the state mineral.

On the link below, is my facebook page, and clicking on **'like'** is a vote in favor of my quest!! Also on my page, is a link to my science paper http://user.pa.net/~dkblack/index.html that I wrote for this assignment.
http://www.facebook.com/pages/PA-State-Rock-Celestine/221235861288507

Would you be interested in helping me? Would you pass the message on to [others] to help support me?
Thank you,
Royce Black
Deb Black

ATTENDING THE FEBRUARY MEETING?
Donations of door prize specimens are invited.
NMS will provide ice, soft drinks, and juice;
your donated snacks will be welcomed.
Bring a friend!

NEWS FROM THE FEDERATIONS

Nittany Mineralogical Society, Inc., is a member of EFMLS, the Eastern Federation of Mineralogical and Lapidary Societies, and therefore an affiliate of AFMS, the American Federation of Mineralogical Societies. We present brief summaries here in order to encourage readers to see the entire newsletters.

The **EFMLS Newsletter** is available through the link on our web site **www.nittanymineral.org** or remind Dave Glick to bring a printed copy to a meeting for you to see.

In the February issue, clubs and club members are encouraged to participate in some of the many projects organized by the Eastern Federation: Bulletin Contest (the web site contest is not mentioned), each One-Teach One, Wildacres Workshops, slide/video contest, All-American Club contest, conventions, and scholarship contributions. President R.J. Harris notes the possibilities of winter collecting when there's no snow on the ground, both in Pennsylvania and farther south; also to the south is Wildacres, with its April and September week-long classes in the mountains of North Carolina. R.J. also reports that fellow central Pennsylvanian and EFMLS volunteer Betsy Oberheim was severely injured in a December auto accident, but is recovering and her spirits are very high. Ellery Borow's safety article concerns safety at shows - collapsing tables, electrical cords and other trip hazards, guards on lapidary machines being used, and much more. The 2012 Wildacres Workshop article notes the Speakers in Residence for this year's sessions: mineral photographer Jeff Scovil in April and Telllus Science Museum curator Julian Gray in September. Lists of classes and a registration form are also in the issue. Articles describing the Club Rockhound of the Year and All American Club programs are presented.

The **AFMS Newsletter** is available by the same methods. The February issue illustrates new prizes in the Endowment Fund Drawing, and requests more prize donations; tickets are $5 each or 5 for $20. President Lauren Williams comments on competitive displays; preparation in all stages is important, and accurate judging will help the competitor to improve. Owen Martin's safety article discusses "Know Your Limits" - for lifting, tolerating heat, managing medical conditions in the field, etc. Five new units are being added to the Future rockhounds of America program; watch for more news. Four Club Rockhounds of the Year are honored with descriptions of their contributions. The next multi-federation field trip will be in the Twin Springs area south of Ontario, Oregon, for varieties of petrified wood, June 13-15, 2012. "Rock Camps" (for example EFMLS's Wildacres) of several federations are described. The ALAA article discusses protecting the environment, and seeks one or two volunteers to organize the reactivation of Rockhound Project H.E.L.P (Help Eliminate Litter Please) - "leave all collecting areas devoid of litter, regardless of how found."

Please see the web sites for the complete Newsletters. There's a lot there! *- Editor*

President's Letter

from David Glick

Please come to the February meeting! We'll have another of Dr. Charlie Miller's wide-ranging talks, with interesting stories tied to the topic of coal and coal mining, particularly through his extensive career as a geologist in Pennsylvania. Please see page 1 and the featured article starting on page 4. As always, your help in downloading and distributing flyers is appreciated. I generally put up quite a few in Deike Building; the rest is up to you.

Thanks to e-mail and social media, there's lots of "buzz" about the new effort to have celestine declared the Pennsylvania State Mineral. Other state representatives who have introduced similar bills in the past (did you know that Rep. Tina Pickett introduced one in 2011?) will probably be on board as well. See page 1.

Our web site has been updated and expanded, and entered in the EFMLS segment of the AFMS web site contest. This was a rather last-minute project, so I apologize for not reaching out widely for contributed materials. If you have writing, illustrations or links which should be included on our web site in the future, I would be happy to have them.

One of the additions to the web site is our 2012 (fifth annual) mineral poster, the work of our own outstanding mineral specimen photographer John Passaneau. See page 3, or "merchandise" on the web site.

I'm in and out of town a good bit and assembling this issue in more of a rush than usual, so there may be a few more errors than usual. I've found that my very poor typing skills descend to the truly dismal level when I don't use the computer every day. I hope you'll understand. Nevertheless I think it's a very good issue and I thank all of those who've provided contributions ready-to-go (and that's true for every month, not just this one). It makes my job more pleasant and rewarding, and provides a better experience for all of our readers.

The Board of Directors has been working on our Annual Minerals Junior Education Day, which has been scheduled for Saturday, March 31, 2012. More volunteers will be most welcome; please contact me at president@nittanymineral.org or another Board member (see page 8). Registration details will be announced later.

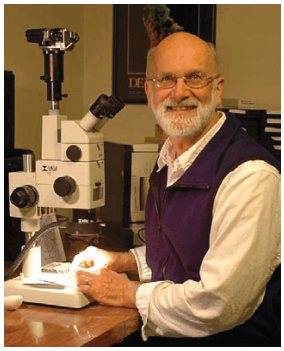
Another great program for families and "kids of all ages" will be our annual Geode Night, Wednesday March 21. Starting at 6:00 p.m., Jeff Smith "The Geode Guy" will be selling and cracking geodes in the lobby. When that's wrapped up at about 7:15, he will present a program on those geodes, and where they come from in the northern Mexico state of Chihuahua. ❄

SPEAKERS IN RESIDENCE

by Steve Weinberger,
EFMLS Wildacres Workshop Committee Chair
from the February 2012 EFMLS News

What a line-up Speaker Coordinator Bruce Gaber has given us for the 2012 EFMLS Wildacres Workshops. Whether you attend the April session or the September session, you're sure to be "wowed"!

Leading off in April (10-15) is Jeff Scovil. You probably know Jeff's name from all the fabulous photographs that have appeared in the major mineralogical and lapidary publications. He is one of the world's best mineral and gem photographers and his book, Photographing MinerALS, Fossils and Lapidary Materials, continues to be a best seller. Jeff is an engaging speaker who will absolutely "wow" you with his talks and fabulous photographs.



September (3 - 9) will feature Julian Gray, curator of Tellus Science Museum in Cartersville, GA. A Georgia native, he has collected minerals since age twelve. Although he is particularly interested in micromounting and optical mineralogy, he enjoys sharing his passion for minerals with others and his illustrated talks will reflect his wide range of interests in minerals and travel.

Registration for the week long Wildacres session still remains a bargain. The April session is $350 while September is $370 per person. This includes the full week's activities plus room and board. The only "extra" added on to the tuition is a small charge for materials fees for the class or classes that you take during the week. Faceting, for example, will be $25 or $30 while classes involving metals may be higher due to the higher cost of silver, gold-filled wire, etc. Instructors are required to keep their materials fees "at cost" in order to keep them as low as possible.

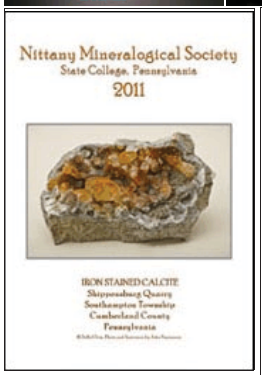
A week at Wildacres is fun, relaxing, and most enjoyable. If you've never been, seriously consider joining the group this year for one or both of the sessions.

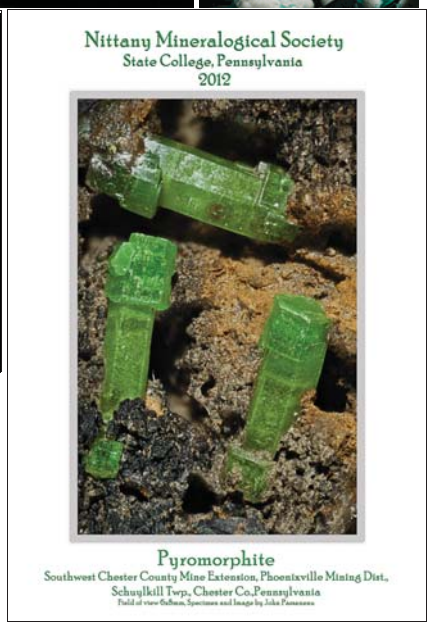
A list of classes being offered along with a registration form are included in [the February 2012] issue of EFMLS News (pages 5-6 and 8). More information and photos can be found on our IF Wildacres Workshop website <www.amfed.org/efmls>. Click on the Wildacres tab. We encourage you to register as early as possible - class sizes are kept small so that you can get the maximum attention from your instructor so the earlier you register, the better your chance of being placed in your first choice. Once a class is filled, you will be assigned to your 2nd or perhaps 3rd or 4th choice, so please be sure to indicate all on the registration form.

I look forward to seeing you at an EFMLS Wildacres Workshop in 2012. I can guarantee you a wonderful week!

❄ ❄ ❄ ❄ ❄ ❄

NMS Posters





Don't forget that we have posters for sale, including a great one of Pennsylvania pyromorphite for 2012! See "Merchandise" at www.nittanymineral.org and contact John Passaneau (p. 8) if you want one; $11 unmounted, $16 mounted including tax. ❄

Our February 15th program:

Coal and Coal Mining

by
Dr. Charles E. Miller, Jr.
Retired Geologist
photographs by the author

The history of coal mining in Pennsylvania is one of evolving mining laws. Earliest mining in the Commonwealth was in 1761 and not until 1945 did the State enact its first law regulating the industry. Early mining laws paled in comparison to present-day law regarding reclamation. Whereas today's surface coal mines must be completely reclaimed, early mining law only required exposed coal seams to be covered. There was no other reclamation. As a result, present-day Pennsylvania inherits a $15 billion legacy of abandoned mine sites (Fig. 1), degraded water (Fig. 2), collapsed deep mines (Figs. 3 and 4), and underground fires (Fig. 5). Acid Mine Drainage (AMD) has polluted over 4,058 miles of Pennsylvania's 83,287 miles of streams. AMD is identified in the State Management Plan as the largest source of non-point source pollution in Pennsylvania. There are over 200,000 acres of abandoned mine lands statewide including 252 miles of unreclaimed and dangerous highwalls, over 1,200 open portals and vertical shafts, 38 underground mine fires, and thousands of acres of culm piles and subsidence- prone land.

Fig. 1. "Pre-Act" or "old-law" abandoned bituminous strip mine; Clearfield County, PA. Abandoned open cuts, such as this, are safety and environmental hazards. The highwalls are dangerous and water commonly collects at the base, interacting with exposed coal to produce acid mine drainage (AMD).

Fig. 2. Stream degraded from AMD; Clearfield County, PA. Most AMD in Pennsylvania streams is the result of pre-law coal mining.

Fig. 3. Abandoned, partially collapsed deep (under-ground) bituminous mine; Clearfield County, PA; 12-22-88. Typical room and pillar pattern is shown. The undisturbed block is where the coal pillar is intact. On either side of the pillar, the rooms have collapsed. This collapse is called deep-mine subsidence. When this deep mining occurred, equipment did not exist that made it economical to strip (surface) mine down to the coal. Abandoned deep mines can be problematical. Commonly, the subsidence can work its way to the surface, even when the coal is 800 feet below the surface as with the Pittsburgh coal. When the subsidence nears the surface, it can affect structures such as houses and roads. Half of Colorado Springs, CO. is underlain with abandoned deep coal mines.

Fig.4. Dept. of Environmental Protection (DEP) Mining Inspector looking at an opening that deep (underground) mine subsidence caused. Abandoned deep mines can be problematical. Commonly, the subsidence can work its way to the surface, even when the coal is 800 feet below the surface as with the Pittsburgh coal. When the subsidence nears the surface, it can affect structures such as houses and roads. Half of Colorado Springs, CO. is underlain with abandoned deep coal mines.

Fig. 5. Damage to Rt. 61 from underground mine fire; Centralia, PA; 11-15-10. Centralia's population has dwindled from 1000+ residents in 1981 to 7 in 2010 as a result of mine fire burning beneath the borough since 1962. In 1992, the Commonwealth of PA condemned all properties under eminent domain. A few residents remain in spite of a failed lawsuit to reverse the decision. Several current and former Centralia residents believe the state's eminent domain claim was a plot to gain the mineral rights to the anthracite coal beneath the borough. For two decades following the start of the fire, the mines were flushed with water and fly ash (pozolone mixture that sets up like cement), excavated the burning material and dug trenches, backfilled, drilled again and again in an attempt to find the boundaries of the fire and to put it out. By the early 1980s the fire had affected approximately 200 acres and homes had to be abandoned as carbon monoxide levels reached life-threatening levels. An engineering study in 1983 concluded the fire could burn for another century or even more and could spread over 3700 acres.

This legacy prompts some people to espouse banning coal mining. However, the role of coal during two world wars and in supplying cheap electricity cannot be overlooked. Today, coal is responsible for nearly 50 percent of electricity generated in the U.S., more than any other single electricity fuel source.

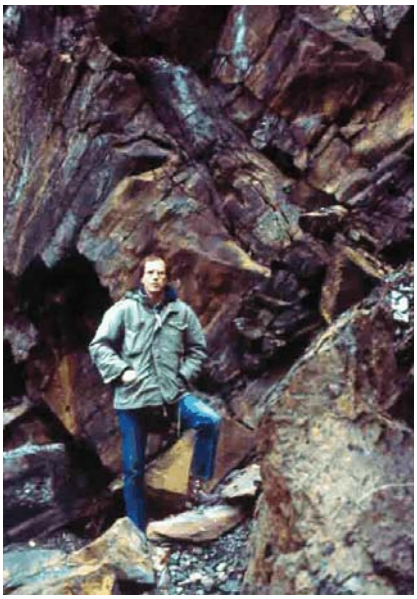


Fig. 6. Petrified (carbonized) tree trunk (center background) in original growth position relative to surrounding strata; note the tree is perpendicular to the strata. The strata have been tilted but the tree is still perpendicular to them. Charles E. Miller, Jr. standing near the tree. Bear Valley Strip Mine; Shamokin, PA; 3-27-88.

Coal has either a limnic or paralic origin. Limnic coal formed inland in freshwater basins, peat bogs, or swamps as opposed to paralic coal formed along the margin of the sea. In either setting, sediment covered accumulated vegetation, causing alteration of organics into coal. Figures 6 and 7) show a typical

Fig. 7. Lepidodendron impression; Bear Valley Strip Mine, Shamokin, PA. This tree was part of the coal forest flora and reached heights of 100 feet.

plant fossil associated with coal. The former is a *Lepidodendron* trunk (diagonally above the author) perpendicular to strata and the latter is an impression of another *Lepidodendron*.

The origin of coal – limnic or paralic – can be useful in predicting whether a coal to be mined will produce AMD. In central Pennsylvania, the Lower and Upper Freeport coals have limnic or freshwater origins. They almost never produce AMD. In contrast, lower coals such as the Mercer, Clarion, Lower Kittanning, and Middle Kittanning have paralic origins and all produce AMD.

Coal seams and accompanying sedimentary strata provide an array of depositional environments. The paludal (swamp) environment of coal contrasts with marine or fluvial sandstones and shales. One of the best examples of this is at Castlegate, Utah (fig. 8) where 10 or more coals are exposed in a roadcut. Multiple seams of paralic coal and accompanying sedimentary rocks indicate cyclic deposition involving marine transgressions (advancing sea; on-lap) and regressions (retreating sea; off-lap).

Fig. 8. Cyclothems. Coal beds in tongue of Mesa Verde Sandstone. Highway 6-50; Castlegate, UT; 6-4-74. Beds below lower-most coal are littoral marine.

Pennsylvania's Bureau of Mining and Reclamation is the nation's leader in applying technologies to regulating coal mining. Among these technologies are overburden analyses,

alkaline addition, special handling, biosolids (Fig. 9), redistribution of alkaline strata, segregating pit cleanings, daylighting abandoned deepmines, and removing abandoned highwalls. Applying these technologies has resulted in an approximate 95 percent success rate for surface coal permits that do not produce AMD. The State receives only approximately $20 million per year in Federal abandoned-mine-land reclamation funds. Additional abandoned-mine-land reclamation is achieved through remining. This program creates an annual value of $22 million – at no cost to the taxpayers. However, combining the two figures and dividing into the $15 billion legacy will require 340 years before fixing the inherited problems.

Fig. 9. Two years' growth of vegetation after sewage sludge (biosolids) application on a reclaimed bituminous coal strip mine; John A. Thompson site; Clearfield County, PA; 1989. This was an abandoned strip mine where topsoil had not been segregated and saved. The biosolids were applied where no topsoil existed. The contrast between applying biosolids and not applying them can be seen in this image. No biosolids were applied in the left right part of the image. Use of biosolids is a good example of recycling a waste product. Prior to applying the biosolids, little or no vegetation would grow at this site due to the absence of topsoil. In just two years, a dense, robust growth of grass has occurred. The benefits of this ground cover are many: producing oxygen, producing habitat for wildlife, reducing runoff and erosion, and facilitating recharge to the ground. The PA. DEP encouraged the use of biosolids on abandoned strip mines.

Blasting is routinely used in most coal mining. The primary explosive is Anfo (ammonium nitrate fertilizer plus diesel fuel) – the same that Timothy McVeigh used. The dangers of blasting are many, including flyrock damage (Fig. 10) and fatalities. Two such fatalities will be discussed. Numerous misconceptions about blasting at surface coal mines persist, including the idea that blasting-generated cracks radiate over great distances. Such cracks radiate 22 times the diameter of the borehole (0.5 feet), or only 11 feet. Insight is also provided into a letter-to-the-editor of the *Centre Daily Times* about blasting that threw an elderly lady across the room. This is an example of selective physics and could rewrite the laws of physics – had it really happened. Another example explains how a textbook dropped from waist-height produced ground vibrations greater than blasting 1000 feet away from a private water well. Finally, the difference between air vibrations and ground vibrations are discussed.

Damage from fly rock. Blasting at a nearby bituminous strip mine produced fly rock (a.k.a. ejecta material) that damaged this structure.

The Pennsylvania State University has a long history of coal research. Examples include using fossils to identify coal seams, fossils for determining coals that produce AMD, hydrogeological characteristics of surface coal mines, hydrology of reclaimed surface coal mines, the origin of underclays, and the distribution of sulfur and carbonate minerals in Pennsylvania rocks and their significance in predicting AMD. Much of that research is used at Pennsylvania's Bureau of Mining and Reclamation, the agency promulgated to regulate the coal industry.

Fundamental principles of stratigraphy and sedimentology can be applied to coal geology. One example is that of paleostream analysis. In the early 1900's, a small Philipsburg (PA) coal operation encountered extensive sandstone units. These were paleostream deposits, representing channel sandstones or point bars of a meandering stream. The company went out of business. However, had they employed a geologist knowledgeable of applied sedimentology, it is possible they could have survived. Field measurements of cross bedding would have provided flow direction, point-bar width, stream width, river depth, mean discharge, velocity, curvature radius, sinuosity, and other related information for a stream approximately 300 million years ago. These measurements and calculations would have guided the coal company where not to mine.

Applications for a surface coal permit require a long preparation and review process. The review is coordinated between many professionals and agencies. An engineer, forester, and hydrogeologist provide most of the permit review, with input from specialists at the Pennsylvania Game Commission (PGC), Pennsylvania Fish and Boat Commission (PFBC), the Pennsylvania Historical and Museum Commission (PHMC), and other agencies. Of particular interest are aquatic surveys that the PFBC provides. Such surveys involve electroshocking stretches of receiving streams for a proposed mine site. These aquatic surveys, in conjunction with geochemical sampling, are a cooperative effort between biologists, chemists, and geologists and provide baseline data to which post-mining comparisons can be made.

Coal mining involves both surface and deep (underground) mining. Examples of the former include strip mining and mountaintop removal. Deep mining includes room and pillar, auger, and longwall mining. Remnants of deep mines are commonly encountered during surface coal mining. Sometimes tools, steel tracks, and coal cars are left in the old tunnels. Deep mines have numerous hydrogeological effects. They act as underdrains at strip mines, effectively dewatering a site. They also act as aquifers, conveying water through mined-out tunnels. Surprisingly, some of that water may meet chemical drinking-water standards. Unfortunately, the abandoned deep mines are also used as sewers. Homeowners commonly drill into underlying deep mines for disposal of human sewage. In one Pennsylvania community, homes on the upgradient end of an abandoned deep mine used the mine as a sewer. At the same time, a farmer on the downgrading end of the same deep mine used the water for his cattle.

While working as a Bureau of Mining and Reclamation hydro geologist, the author conducted a hydro geological investigation of a coal strip mine in Clinton County, Pennsylvania. Selected details of this investigation are discussed, including site geology, history of mining, and court-case drama.

A classic hydro geological disaster involving a deep mine occurred in 1959 in Luzerne County (PA) when the Susquehanna River catastrophically collapsed into an underground coal mine, the Knox Mine. At the time, 81 miners were in the mine of which 12 eventually perished. A total of 10,000 men were put out of work by ending deep mining for miles around. It took six months to seal the mine. So large was the sinkhole that railroad cars were driven into the void to help seal it. An archival video of the Knox Mine Disaster will be shown.

Geo-Sudoku

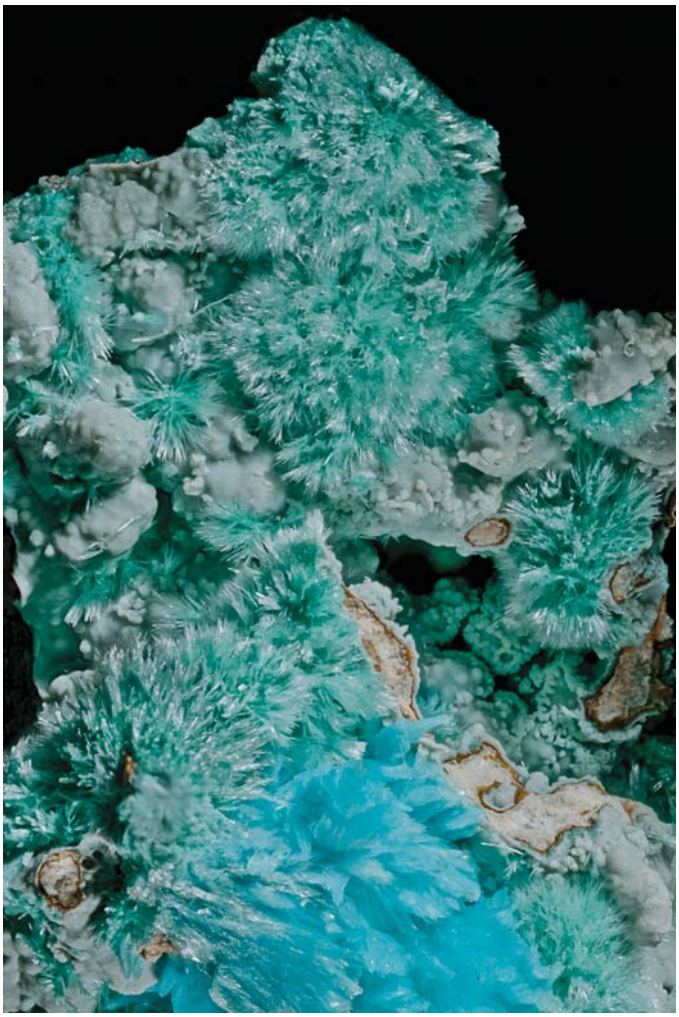
by David Glick

This puzzle contains the letters ADEGNORSU, and one row or column spells one description of old coal mine highwalls. Each block of 9 squares, each row, and each column must contain each of the nine letters exactly once. The solution is on page 8.

S			N	E		U		D
				D			R	A
	E		G		A	S	O	
	A	U			D			G
R		O				D		
G	D	S						R
	S		D	R				
O		D	E		G		A	
								S

Photo Gallery

by John Passaneau



This is langite (blue green) and aurichalcite (sky blue) from the Grand View Mine, Cape Royal, Horseshoe Mesa, Grand Canyon National Park, Coconio County, Arizona.

The Grand View mine was a copper uranium mine that was located on the north rim of the Grand Canyon. It was discovered in 1890 and closed in 1916.

The minerals were secondary copper minerals and uranium minerals, and it is the type locality for Grandviewite, a copper uranium carbonate. The mine is in a breccia zone in the Shea basalt hosted in the Navajo sandstone. The Grand View as one of several mines that were located in the park, all are now closed and no collecting is allowed. In the early 70's collecting was allowed for a time in the Grand View and that's when I obtained this specimen along with some others for my micro mount collection. I photographed this back in the day of slide film using the same lens and bellows system I still use. It is interesting see the difference between the film and digital photos. Digital gives me so much more controls than I had with film. This was done with the focus stacking method utilizing 19 images to get the required depth of focus I wanted. The field of view is about 6mm by 7mm.

Some Upcoming Shows and Meetings

Our web site http://www.nittanymineral.org has links to more complete lists and details on mineral shows and meetings around the country.

March 3-4, 2012: Annual Gem, Mineral & Fossil Show by Delaware Mineralogical Society. Newark, DE

March 10-11, 2012: North Jersey Gem and Mineral Show by The North Jersey Mineralogical Society. Pope John Paul II Center, 775 Valley Rd., Clifton. Sat & Sun 10-5. http://nojms.webs.com/annualspringshow.htm http://nojms.webs.com/2012springflyer.jpg

March 24-25, 2012: Annual Gem & Mineral Show by Che-Hanna Rock & Mineral Club. Athens Twp. Volunteer Fire Hall, 211 Herrick Ave., Sayre PA. Sat 9-5, Sun 10-5. http://www.chehannarocks.com/show.html

March 24-25, 2012: Gem, Mineral & Jewelry Show by Franklin County PA Rock & Mineral Club. NEW LOCATION: Hamilton Heights Elementary School, 1589 Johnson Rd., Chambersburg. Sat. 10-5, Sun. 10-4.

March 31-April 1, 2012: Philadelphia Mineral Treasures and Fossil Fair, by Phila. Mineral. Soc. & Del. Valley Paleontological Soc. Incl. speakers & PA minerals display by Acad. Natural Sci. of Phila. Lulu Temple, 5140 Butler Pike, Plymouth Meeting, PA Sat. 10-5, Sun. 10-4. http://phillyrocks.org/

April 19-22, 2012: Rochester Mineralogical Symposium. Rochester, New York. www.rasny.org/MineralSymp.htm

April 28-29, 2012: New Jersey Earth Sci. Ass'n Gem & Mineral Show by FOMS, NJESA & Sterling Hill Mining Museum. Franklin Borough School, 50 Washington Av., Franklin, NJ.

May 12, 2012: South Penn Rock Swap - SPRING SWAP by Franklin County & Central PA Rock and Mineral Clubs. South Mountain Fairgrounds, 1.5 miles West of Arendtsville, PA on Route 234. Sat only, 8 a.m. to 3 p.m.

May 19-20, 2012: "World of Gems and Minerals" by Berks Mineralogical Society. Rt 61, 7 miles South of I-78, Leesport Farmers Market, Leesport PA. Sat 10-5, Sun 10-4.

June 2, 2012: Spring Mineralfest by Pennsylvania Earth Sciences Association. Macungie Memorial Park, Macungie, PA. Saturday only 8:30 - 3:00. Www.mineralfest.com

Sept 15-16, 2012, Eastern Federation of Mineralogical and Lapidary Societies Convention, and Central Pennsylvania Rock and Mineral Club Annual Show, Harrisburg

October 27, 2012: South Penn Rock Swap - AUTUMN SWAP by Franklin County & Central PA Rock and Mineral Clubs. South Mountain Fairgrounds, 1.5 miles West of Arendtsville, PA on Route 234. Sat only, 8 a.m. to 3 p.m.❄

Geo-Sudoku Solution from page 7

S	O	A	N	E	R	U	G	**D**
N	U	G	S	D	O	E	R	**A**
D	E	R	G	U	A	S	O	**N**
E	A	U	R	N	D	O	S	**G**
R	N	O	A	G	S	D	U	**E**
G	D	S	U	O	E	A	N	**R**
A	S	N	D	R	U	G	E	**O**
O	R	D	E	S	G	N	A	**U**
U	G	E	O	A	N	R	D	**S**

For sale / trade: Equipment & Materials

For sale: Inland Lapidary All in Wonder 6" flat lap, cut off saw, and grinder combo with newer motor, Inland Lapidary diamond band saw, and a double barrel rock tumbler that holds a total of 6 lbs. There are many extras included. Paid over $1000 for everything, asking $350 or best offer. State College area. Please call Mike at 814-571-9672 or email at mikerockcutter@aol.com

For sale: Highland Park lapidary saw, Model E4, 8" diamond blade, mounted on a stand, ready to use. Contact Willard Truckenmiller, phone 814-625-2531 (9:00 a.m. to 9:00 p.m.) or e-mail jowilltruck@aol.com

For sale: Large mineral collection; will sell all or part. Tumble polisher with three 12-lb. and one 6-lb. drum plus grits, polishes and pellets. My phone number is (570) 672-2325. Leave a message if I'm not in.

For sale: Jade in various types & colors; mostly rough, plus some slabs; some fine Coober Pedy opal. Also equipment and jewelry making supplies from jewelry studio and production shop. Contact Daniel G. Reinhold in Mill Hall, PA; phone 570 726-8091 after lunch every day, or e-mail: dreinhold1@comcast.net ❄

SOCIETY OFFICERS

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Door Prizes: *volunteer needed!*
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The **Bulletin Editor** will welcome your submissions of articles, photos, drawings, cartoons, etc., on minerals, fossils, collecting, lapidary, and club activity topics of interest to the members. Please contact:

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Newsletter submissions are appreciated by the first Wednesday of the month. If you include photographs or graphics, please do not embed them in word processor files; send them as separate graphics files (TIF, or good to highest quality JPEG files, about 1050 pixels wide, are preferred). Please provide captions and name of photographer or artist.

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